



Intentions to take night trains (sleepers) for leisure trips: A study in London

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Abstract

Despite the revival of night trains across Europe, understanding what drives travellers to choose this mode of transport remains mostly underexplored. This study examines Londoners' intentions to take night trains for leisure travel, positioning environmental concern as a key antecedent within the Theory of Planned Behaviour. Survey data from 278 respondents reveal that environmental concern significantly shapes travel attitudes and intentions, with the model explaining 60% of the variance in night train adoption. Ecological consciousness and familiarity with the service offer emerge as the primary drivers of night train intentions, outweighing social pressure. For rail operators and policymakers, findings suggest targeting sustainability-oriented travellers, enhancing service familiarity through promotional trials and experiential marketing, and addressing social perceptions that may hinder adoption. Also, this study contributes to sustainable mobility research in metropolitan contexts and invites further investigation into how environmental values and peer influence shape travel choices across diverse urban settings, particularly in understanding the complex role of subjective norms in sustainable transport decisions.

Keywords: night trains, sleeper trains, theory of planned behaviour, environmental concern, sustainable tourism, rail travel intentions

1. Introduction

After nearly two decades of decline, night trains (sleepers) in Europe are making a comeback, with new services and operating companies emerging. The Austrian Federal Railways (ÖBB) were in 2021 “the biggest railway undertaking providing night train services in Europe” (Dömény & Dolinayová, 2021, p. 6); in the same year, “German, French, Swiss, and Austrian railways started to renew their night routes and plan new openings” (Gerosa & Cellina, 2024, p. 1). The French government-owned SNCF resumed operating the sleeper service from Paris to Nice in May 2021, which had been discontinued in December 2017 (Le Monde, 2021). As of 2025, there are four night train services operating domestically in France (SNCF). Next, European Sleeper (2025), a cooperative, was launched in 2021 with the mission of making “night train travel a comfortable, sustainable, and adventurous alternative once again”. It currently operates one regular service connecting Brussels to Prague, calling in Amsterdam and Berlin among others, and plans to extend its network to Milan (European Sleeper, 2025). Night trains offer a more environmentally friendly option than cars or flying, with key benefits such as saving “hours of daytime travel, as most travel is spent asleep. Departure and arrival times, if well selected, allow for efficient use of time at destination” (Hueso-Kortekaas, 2024, p. 11). Furthermore, the opportunity to depart and arrive directly in the destination city centres, enjoy more space than on a plane, and save the cost of at least two hotel nights on a return trip are additional benefits of travelling by night trains.

However, despite the relevance of sleeper trains, the literature on travelling by night trains remains limited to only a few studies (Abramović et al., 2025). While research on night trains has grown in recent years, with studies such as Buh and Peer (2024), Curtale, Larsson, and Nässen (2023), Gerosa and Cellina (2024), Heufke, Kantelaar et al. (2022), and Morfeldt et al. (2023) providing valuable insights, earlier academic work specifically focused on night train travel behaviour is scarce. Existing research on sleepers has primarily focused on technical aspects, such as the impacts of noise and vibration on travellers' sleep quality rather than on travellers' behavioural intentions or travel choices. This gap in the

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literature underscores the need for studies examining the psychological and behavioural factors that influence decisions to take night trains.

The present research builds on Buh and Peer's (2024) work on the drivers of night train travel intentions, emphasising the contribution of environmental concerns in Vienna, Austria. Like the Austrian study, our work builds on the Theory of Planned Behaviour (TPB; Ajzen, 1991) to estimate individuals' intentions to travel by night trains for a leisure trip. However, our study extends the previous work by Buh and Peer (2024) in two ways. First, we examine another key transport hub: London and its surrounding area. This larger metropolitan region represents an ideal setting for understanding the future potential of night train services: As one of Europe's largest urban centres and a key hub for international connectivity, London offers a strategic context for exploring and understanding how metropolitan populations who are often at the forefront of sustainable mobility trends perceive and intend to use night train services. Understanding how environmental concern among this urban population translates into travel intentions is particularly relevant, as metropolitan areas are and will be the critical markets for the expansion of cross-border night train networks. Second, and more fundamentally, we propose a theoretical refinement of TPB's application in the context of sustainable travel behaviour. Specifically, we position environmental concern as an antecedent construct of the TPB's attitudes, subjective norms, and perceived behavioural control triad, rather than as a direct predictor or moderator of intentions. Conceptualisation aligns with emerging evidence in environmental psychology suggesting that environmental values and concerns shape the formation of specific attitudes and normative beliefs (Hauslbauer et al., 2022).

2. Literature review

Understanding travel requires integrating established psychological theories with context-specific factors. This concise literature review examines how the Theory of Planned Behaviour has been applied to understand sustainable travel choices, with a focus on emerging research in rail mobility.

Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour (TPB) is a foundational model for predicting behavioural intentions, positing that attitudes, subjective norms, and perceived behavioural control drive intentions and behaviour (Ajzen, 1991). TPB's predictive validity, on average explaining over 50% of intention variance, is demonstrated in meta-analyses across diverse fields (Ajzen, 1991). It is often extended to incorporate context-specific drivers, making it well-suited to emerging travel modes, such as sustainable rail mobility.

TPB in Travel Research

TPB has proven especially valuable in transportation studies, helping explain public transport, cycling, and sustainable travel choices (Buh & Peer, 2024; Morten, Gatersleben, and Jessop, 2018; Heath & Gifford, 2002). Its flexibility enables the incorporation of additional factors such as experience and environmental concern. Travel mode research finds that attitudes and perceived behavioural control are powerful predictors of intentions to shift away from air travel toward alternatives such as rail, highlighting TPB's relevance in evolving mobility landscapes.

Rail and Night Train Travel

Night train travel literature is emerging, with studies profiling user motivations and segmenting travellers (Gerosa and Cellina, 2024). Comfort and privacy are critical factors (Heufke Kantelaar et al., 2022). Swedish data show that up to 30% of air travellers would switch to night trains if improvements were made in price and amenities (Curtale et al., 2023). In Switzerland, sustainability-oriented travellers are drawn to night trains for their lower environmental impact (Gerosa & Cellina, 2024). Thus, both ecological values and practical convenience underpin the adoption of night rail.

Intention to Travel (at Night)

The intention to take a night train is shaped by diverse factors, including overnight travel, costs, comfort, and environmental impact. TPB-based studies show that environmental concern, operator familiarity, and perceived costs play significant roles (Buh & Peer, 2024). Their Vienna sample found these factors, alongside classical TPB constructs, explained more than half of the variance in travel intentions. Our study advances this model by positioning environmental concern as an antecedent to TPB constructs, suggesting that ecological values influence attitudes, norms, and perceived control, which, in turn, drive intention rather than affecting it directly.

2.1. Conceptual model

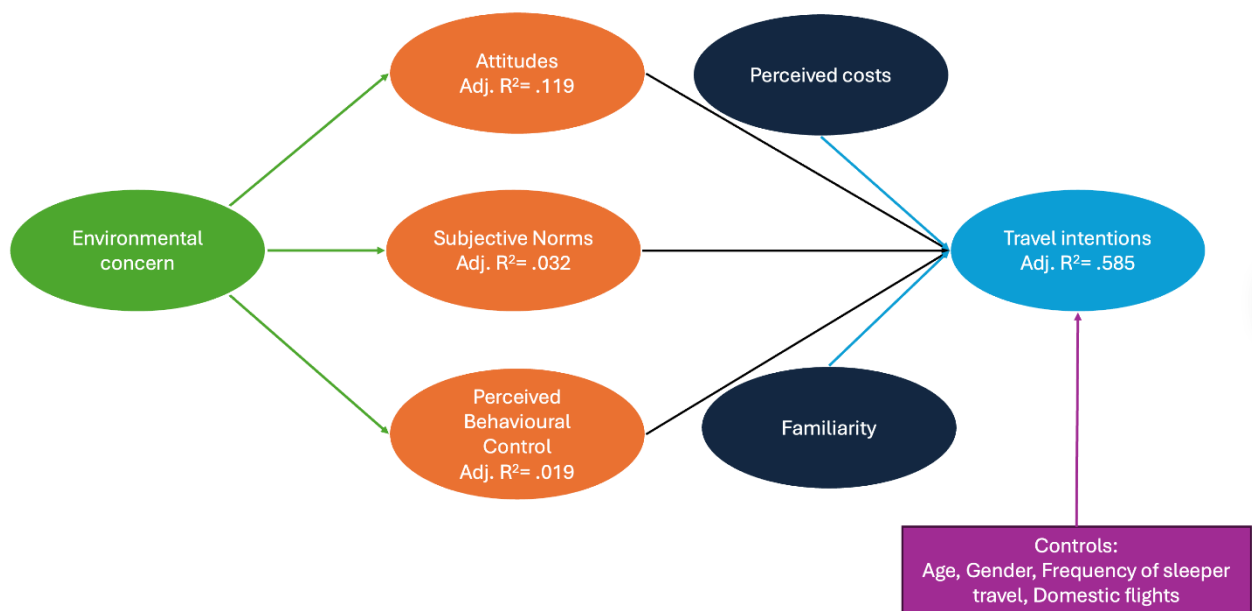
Building on Buh and Peer's (2024) empirical work, we adopt the Theory of Planned Behaviour (TPB; Ajzen, 1991) as our baseline framework and introduce a theoretically meaningful modification regarding the role of environmental concern. In their work, Buh and Peer (2024) demonstrated that, alongside individuals' attitudes, subjective norms, and

perceived behavioural control, i.e. the core constructs of TPB, additional dimensions such as environmental concern, familiarity with the night train operating company, and perceived costs significantly influence intentions to travel by sleeper trains. However, in their model, environmental concern was positioned as a direct predictor of travel intentions, operating in parallel with the traditional TPB constructs.

In our study, we propose a conceptually distinct approach, informed by recent theoretical developments in environmental psychology and sustainable transport research (Hauslbauer et al., 2022). Specifically, we position environmental concern as an antecedent construct of the TPB's attitudes, subjective norms, and perceived behavioural control. This conceptualisation is supported by empirical evidence from Donald, Cooper, and Conchie (2014), who found that environmental concern influences transport mode choice indirectly through habit and intention constructs rather than directly on behaviour. Similarly, research integrating the Norm Activation Model with TPB has demonstrated that environmental awareness and concern serve as upstream factors that activate personal norms and shape attitudes toward sustainable transport behaviours (Liu et al., 2017). Furthermore, Hauslbauer et al. (2022) found that environmental concern functions as a foundational value that shapes the formation of attitudes and subjective norms regarding public transport use, rather than directly determining behavioural intentions.

We posit that an individual's level of environmental concern serves as a fundamental driver, shaping their attitudes toward night train travel, influencing their perceptions of subjective norms surrounding sustainable travel choices, and affecting their perceived behavioural control over night train use. These TPB constructs, in turn, along with familiarity with night train operators and perceived costs, collectively determine travellers' intentions to use night trains for leisure trips. Though minor, yet this is a fundamentally powerful theoretical refinement wherein we position environmental concern as an antecedent, and thus acknowledge that environmental values and awareness create the psychological foundation upon which specific travel-related attitudes, norms, and control perceptions are built. This conceptualisation better reflects the hierarchical nature of psychological constructs: broad environmental values influence domain-specific beliefs, which in turn shape behavioural intentions.

Figure 1. Nomological network created by the authors



Source: Authors

3. Methodology

We conducted an online survey in August 2025, and the selected participants reside in London, United Kingdom. The questionnaire was based on the literature, e.g., Ajzen and Driver (1992), Buh and Peer (2024), Morten et al. (2018). The items making up the structural model were all measured on a 7-point scale.

All respondents (N=306) were Londoners recruited through Prolific. This international crowdsourcing platform provides the highest-quality data at the lowest cost, surpassing professional panels for behavioural research and Amazon's Mechanical Turk (Douglas et al., 2023; Pe'er et al., 2022). "Prolific [...] is a large step towards a dedicated online participant pool for sound scientific research" (Palan & Schitter, 2018, p. 26). The survey was conducted on the 11th of August 2025; participants were remunerated £0.50 for their effort. After screening participants for inconsistencies or

incomplete participation and failing either of the three attention tests, the final sample consists of $N = 278$ respondents, i.e., 91% of the initial participants.

Table 1. Descriptive statistics

Characteristics of respondents	
Gender	Male: 45.3% Female: 54.7%
Age	Average: 40 years old, standard deviation 12.5
Frequent domestic flights	Yes: 12.2% No: 87.8%
Number of trips by night train (sleeper) in the preceding 24 months	0: 72.3% 1-4: 25.2% 5 or more: 2.5%

Source: Authors

The three main dimensions of the TBP — i.e., attitudes, subjective norms, and perceived behavioural control — were measured using a single item. Each was then multiplied by its respective weight and rescaled from -3 to +3, as in Buh and Peer (2024). Appendix 1 reports the descriptive statistics of these measures. Then, next to gender and age, as in Buh and Peer (2024), we added the number of sleeper trips and the number of domestic flights over the past 24 months. As of the time of writing, only three sleepers operating from Sunday to Friday serve the United Kingdom. The Great Western Railway's Night Riviera Sleeper connects London Paddington and Penzance in the extreme southwest of England. The Caledonia Sleeper serves London Euston to Scotland, either to the north, the Highlander, or the Lowlander to Glasgow and Edinburgh (National Rail, 2025).

A structural equation model was run to test the model. We performed a PLS model using SmartPLS 4 (Ringle, Wende, and Becker, 2024), as we are analysing the drivers of a dependent endogenous construct, i.e. travel intentions. Also, the sample size is small, and the data are non-normally distributed (Hair et al., 2014). The predictive power of this analytical tool, in our case to estimate the effects on the intention to take a sleeper, makes it a reasoned choice for data modelling. Appendix 2 reports the items used for the examined latent constructs.

4. Results

The estimated PLS model explains slightly over half of the variance in travel intentions for night trains, with $R^2 = .599$ (Adjusted $R^2 = .585$), which is consistent with the original study's R^2 of .52 (Buh & Peer, 2024) and higher than that reported by Hauslbauer et al. (2022). Looking at the effects of environmental concerns, this construct influences an individual's attitudes, subjective norm, perceived behavioural control, and intention to take a night train (sleeper) for leisure in the 24 months following the survey. The explanatory power of environmental concern for TPB dimensions, however, is minimal. Environmental concerns explain only 12% of the variation in individual attitudes (Adjusted $R^2 = .119$), and even less — i.e., 3% for Subjective Norms (Adjusted $R^2 = .032$) and 2% for Perceived Behavioural Control (Adjusted $R^2 = .019$). The direct effects of environmental concern on these three constructs are all statistically significant, with β s of .349 ($p < .001$) for attitudes, .189 ($p < .01$) for subjective norms, and .150 ($p < .05$) for Perceived Behavioural Control. Table 2 summarises the direct effects of the structural model. The indirect effects from environmental concern to intentions to take a night train (sleeper) are also significant ($\beta = .164$, $p < .001$).

Table 2. Effects of the structural model

Independent construct or variable	Dependent construct or variable	β
Environmental concern	Attitudes	.349***
	Subjective norms	.189**
	Perceived behavioural control	.150*
Attitudes	Travel Intentions	.518***
Subjective norms		-.086*
Perceived behavioural control		-.004 ^{NS}
Familiarity		.371***
Perceived costs		-.052 ^{NS}

^{NS} $p > .05$; * $p < .05$; ** $p < .01$; *** $p < .001$

Source: Authors

Attitudes towards travelling by night train (sleeper) positively affect travel intentions. Surprisingly, the effects of Subjective Norms and Perceived Behavioural Control are not all as expected. The relationship between Subjective Norms and Travel intentions is negative, suggesting that the stronger the peer pressure in favour of taking night trains, the lower individuals' travel intentions. Further investigation is needed to determine whether this result is related to the examined population (Londoners), the small sample size, the use of a single-item indicator, or other factors. Alike, Perceived Behavioural Control exerts no effects on Travel Intentions, confirming Hauslbauer et al. (2022) and challenging Buh and Peer (2024). The reason for this unexpected result also lies unanswered and would require further examination.

5. Discussion

This study examined Londoners' intentions to take night trains for leisure trips over the next 24 months, building on the Theory of Planned Behaviour (TPB) and extending it by incorporating environmental concern as an antecedent construct. The findings provide important insights into the psychological mechanisms that drive night train adoption and offer valuable implications for theory, policy, and practice.

Theoretical Implications

Our study confirms and extends recent literature by positioning environmental concern as an antecedent within the TPB framework. The model explains more than half of the variance in travel intentions, consistent with Buh and Peer's (2024) findings and exceeding the meta-analytic evidence provided by Armitage and Conner (2001). Environmental concern significantly influences attitudes ($\beta=.349, p<.001$), subjective norms ($\beta=.189, p<.01$), and perceived behavioural control ($\beta=.150, p<.05$), with a total indirect effect on intentions of $\beta=.164 (p<.001)$, supporting environmental psychology propositions (Hauslbauer et al., 2022).

Attitudes ($\beta=.518, p<.001$) and familiarity ($\beta=.371, p<.001$) emerged as the strongest predictors, underscoring the importance of experiential knowledge and trust for this adoption. Two unexpected findings warrant attention: subjective norms' negative association with intentions ($\beta = -.086, p < .05$), possibly reflecting psychological reactance (Brehm, 1966), while perceived behavioural control showed no effect ($\beta = -.004, p > .05$), likely due to the limited availability of UK night trains. These findings call for further research into social influence and infrastructure constraints in metropolitan mobility contexts.

Managerial Implications

Promotion strategies: Operators should emphasise night trains' environmental and comfort benefits alongside practical advantages such as time efficiency, cost savings, and space utilisation through dual framing that appeals to both sustainability values and self-interest (Steg and Vlek, 2009).

Experiential marketing: Increase familiarity through discounted trial tickets, partnerships with travel agencies, social media storytelling, and clear information about routes, onboard services, and ticketing to reduce uncertainty and build trust.

Segmented communication: Tailor marketing to traveller segments like environmentally conscious "greens," convenience-focused "pragmatists," and sceptical "dissonants", and thus framing night trains as a "smart" lifestyle choice performed by many people rather than a moral obligation to reduce reactance (Cialdini et al., 2006).

Policy Implications

Policymakers should prioritise infrastructure investment to expand night train networks, improve connectivity to European routes, and ensure competitive pricing. Regulatory support, including track access agreements, subsidies for new routes, and coordination with European operators, can enhance service availability and strengthen perceived control over the service. Incentivise modal shifts through pricing mechanisms, tax benefits for sustainable travel, co-branded campaigns with operators, and integration into national transport strategies. Given the UK's commitment to achieving Net Zero by 2050, promoting night trains aligns with climate goals while offering immediate, cost-effective emissions reduction compared to aviation and private car use.

Social and Practical Implications

Environmental impact: Transitioning leisure travellers from short-haul flights and car journeys to overnight trains can significantly reduce carbon emissions. Night trains emit up to three times less CO₂ per passenger than flights (Department for Transport, 2023), contributing directly to climate mitigation goals and improving urban air quality.

Accessibility and equity: Expanding night train services can enhance travel accessibility for individuals who cannot afford flights, prefer not to fly, or have mobility constraints that make overnight rail travel more comfortable. This democratises sustainable travel options and promotes social inclusion in leisure mobility.

Urban-rural connectivity: Night trains can strengthen connections between major cities and peripheral regions, supporting regional tourism economies and reducing the concentration of travel demand on peak daytime services. This distributes economic benefits more equitably across destinations.

Quality of life: Night trains offer a less stressful travel experience compared to early morning flights or long-distance driving, allowing travellers to arrive refreshed and maximising time at destinations. This enhances overall travel satisfaction and well-being, particularly for families and older adults.

Cultural shift: Promoting night trains contributes to broader cultural change toward sustainable mobility, normalising low-carbon travel choices and challenging the dominance of aviation for short- to medium-distance journeys. As familiarity increases, night trains can become an aspirational and socially desirable mode of travel.

6. Conclusion and future research

This study advances sustainable travel literature by validating environmental concern as a key antecedent in travel intention models and highlighting critical roles of attitudes and familiarity. The findings offer actionable insights for operators, policymakers, and society at large, demonstrating that night trains provide environmental, social, and practical benefits that extend beyond individual travel choices. Future research should employ longitudinal designs to track the translation of intention into behaviour, conduct multi-city comparative studies to enhance generalizability, and use qualitative methods to unpack the unexpected effects of subjective norms and perceived behavioural control. Understanding and addressing psychological and structural barriers will be essential as the European night train renaissance continues, catalysing modal shifts toward greener, more sustainable travel.

Declaration

The authors have used an AI-based software (Grammarly) to proofread this article and SciSpace. No other AI tool has been used anywhere else throughout the research process.

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Appendix 1. Measures

	Measure	Average (Std dev)	Min	Max
Attitudes (measure)	For me to take a night train (sleeper) for leisure, holidays or visiting family or friends over the next 24 months would be... 1=Not likely at all, 7=Very likely. Adapted from Morten et al. (2018), p. 300	4.385 (1.768)	1	7
Attitudes (weight)	To take a night train (sleeper) for leisure, holidays or visiting family or friends over the next 24 months would be desirable... 1= I do not agree at all, 7=I strongly agree.	1.022 (1.590)	-3	3
Social Norms (measure)	I am expected to take a night train (sleeper) for leisure, holidays, or visiting family or friends over the next 24 months... 1=I do not agree at all, 7=I strongly agree Adapted from Morten et al. (2018), p. 300	3.396 (1.955)	1	7
Social Norms (weight)	Generally speaking, how important is for you what others think you should do? 1=Not important at all, 7=Very important	-.612 (1.581)	-3	3
Perceived Behavioural Control (measure)	If I wanted to, I could take night trains (sleeper) for leisure, holidays or visiting family or friends over the next 24 months. 1=I do not agree at all, 7=I strongly agree Adapted from Morten et al. (2018), p. 301	5.180 (1.421)	1	7
Perceived Behavioural Control (weight)	For me, to take a night train (sleeper) would be... 1=Not easy at all, 7=Very easy Adapted from Ajzen and Driver (1992), p. 215.	.784 (1.350)	-3	3
Travel intentions	Within the next 24 months, I will take a night train (sleeper) in the United Kingdom. Adapted from Buh and Peer (2024), p. 4.	3.752 (2.000)	1	7
	Within the next 24 months, I intend to take a night train (sleeper) in the United Kingdom. Adapted from Buh and Peer (2024), p. 4.	3.845 (2.020)	1	7
	Within the next 24 months, I would like to take a night train (sleeper) in the United Kingdom. Adapted from Buh and Peer (2024), p. 4.	4.838 (1.905)	1	7
Environmental concern	It is my responsibility to take action to fight climate change. Adapted from Buh and Peer (2024), p. 4.	5.029 (1.596)	1	7
	Climate change is one of the biggest issues facing the world. Adapted from Buh and Peer (2024), p. 4.	5.561 (1.604)	1	7
	When picking a mode of transport, I consider my impact on climate change. Adapted from Buh and Peer (2024), p. 4.	4.421 (1.774)	1	7
Age	What is your year of birth? Please type in all the four digits.	1985 (12.5)	1950	2006
Frequency of travelling by night trains (sleeper)	How many times have you taken a night train (sleeper) in the last 24 months?			
	If you have taken no night trains (sleepers) in the last 24 months, please write 0. Each return trip on board of night trains (sleepers), counts for 2 times.	.759 (2.950)	0	45
Frequency of domestic flights		.122 (0.328)	0	1

Appendix 2. Latent constructs

Construct	Item	Factor Loading	Cronbach's alpha	Composite Reliability
Travel intentions	Within the next 24 months, I will take a night train (sleeper) in the United Kingdom.	.956***	.924***	.952***
	Within the next 24 months, I intend to take a night train (sleeper) in the United Kingdom.	.965***		
	Within the next 24 months, I would like to take a night train (sleeper) in the United Kingdom.	.872***		
Environmental concern	It is my responsibility to take action to fight climate change.	.915***	.872***	.920***
	Climate change is one of the biggest issues facing the world.	.850***		
	When picking a mode of transport, I consider my impact on climate change.	.906***		

^{NS} p>.05; * p<.05; ** p<.01; *** p<.001